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## SOCIETY OF ARTS.

FRIDAY, JUNE 3rd, 1853.

## SECOND EXTRAORDINARY MEETING,

*Monday, May 30th, 1853.*

THE Second Extraordinary Meeting of the Society was held on Monday, May 30th, Thomas Winkworth, Esq., in the chair.

A paper was read by Mr. Wenham, "On a Method of Constructing Glass Balance Springs, and their Application to Time-keepers."

After a few introductory observations, Mr. Wenham proceeded:

"I next contrived an instrument, in which a regular temperature can be maintained in the cone for any length of time, and which is also provided with a means of placing the axis at any desired angle, for the purpose of making the coils more or less open. It consists of a perpendicular rod, screwed into a heavy base loaded with lead, and a circular flat disc of brass, about one inch in diameter, provided at the back with a socket and clamping screw, for fixing it at any height on the vertical rod. The disc should be divided into degrees around its upper margin. To the flat face of the disc is fixed a piece of brass of rather less diameter, by means of a central screw, so as to allow it to rotate easily; this piece is shaped like the lid of a pill-box, and should have an index on the upper portion of its periphery, to point out the divisions on the disc. A steel rod is passed through two holes drilled in the rim of the rotating piece, in a direction across its diameter. The rod is kept in its place by means of a semi-circular brass spring, which is fixed to the inner edge of the rim of the rotating piece by means of a screw. The steel rod turns with a gentle friction, caused by the pressure of the spring, one of the ends of which enters a shallow groove turned around the rod for the purpose of preventing it from moving endways. One end of the steel rod is furnished with a milled head for turning it by, and the other end is provided with a screw socket, for containing the stems of cones of various forms and sizes. The cones are made hollow, and very thin, and they would no doubt be preferable if made of silver or platina; though I have used brass, and found it to answer very well.

"Each cone must be provided with a separate stem of steel, which must be turned down to a very small diameter next to the apex; this is necessary, to prevent the heat from being conducted away too rapidly when the cone is in a state of incandescence. The collar of the stem, where it screws into the rod, should have two facets filed upon it, for the purpose of unscrewing it by means of a pair of forceps or pliers, as any attempt to turn it by the cone would wring the thin neck asunder. Close to the apex of the cone there is a small hole drilled, for the purpose of containing the end of the glass thread about to be bent.

"The method of using this instrument is as follows. Having selected a piece of thin window

glass, free from bubbles and veins, cut it into strips varying from one-tenth to one-eighth of an inch wide. Hold one of these at about three-quarters of an inch from the end, in the flame of a gas or oil lamp urged by a common blowpipe. When the glass is sufficiently softened, draw it out carefully and slowly into a thread of the required thickness, which may be easily done after a little practice. Break off a sufficient length to form the intended spring, leaving the portion of the strip of glass three-quarters of an inch long attached, as this will afterwards serve the useful purpose of a weight for drawing the thread close upon the surface of the hot cone during the operation of coiling up the spring. Take the free end of the glass thread just formed between the fingers, and hold it for an instant in the lower part of the flame of the lamp when not urged by the blowpipe; the end of the thread will then fuse, and form a minute bulb: allow this to cool, and then place it again in the flame and quickly withdraw it. This will soften the neck of the bulb, and cause it to hang at right angles to the thread. This may be performed without any difficulty, and is done in order to obtain a kind of hook at the end of the thread, for the purpose of suspending it by. Next bring the small hole in the apex of the cone into a position facing you, by means of the milled head, and pass the overhanging bulb at the end of the glass thread into it, and allow the piece of glass left at the other end to serve for a weight, to swing free. Now, by means of the division-plate, place the axis of the cone at the required angle, and direct a pencil of flame into its interior; the whole surface of the cone will then speedily acquire a red heat, which may be maintained with uniformity.

"When the cone has arrived at the proper temperature for softening the glass, turn the milled head at the other end of the rod in a direction from you, without removing the blowpipe, and the glass thread will be wound round the red-hot cone in a direction from the apex to the base, at the same time drawing up the piece left for a weight, which keeps the thread stretched, and causes it to ply close to the surface of the cone. When it has arrived at the base, allow the cone to cool, break the weight off the glass thread, and draw the bulb out of the aperture at the apex, and then push the coil back on the rod. Repeat this operation till you have made as many coils as the rod will conveniently hold, and remove them by unscrewing the cone.

"For the purpose of flattening the coil, get a piece of bar iron, about one inch broad and one-eighth thick; file the surface of one of the ends quite flat and smooth, and heat it in a clear fire to a dull red; free it from all particles of cinder, then take up one of the glass springs with a pair of forceps, and drop it upon the flattened end of the hot iron, which, if sufficiently heated, will immediately cause it to sink down close to the surface. When the iron has cooled down to below the softening temperature of glass, turn it over, and allow the finished spring to drop off, and heat the iron again for the next operation. If the spiral, when removed from the cone, does not stand with its axis perpendicular when placed on a level surface, it is apt to cause the coils to lay closer on one side of the spring than on the

other during the flattening process. This may be remedied by properly inclining the hot iron just before the spring is placed upon it. This part of the manipulation is best performed by daylight, taking care not to make the iron too hot, or it may cause the glass to adhere to it. If these operations have been skilfully performed, the result will be a perfect and regular coil; and in the process of drawing out the glass thread, a practised hand may give it a regular taper, for the purpose of obtaining a spring, the coils of which shall gradually diminish in thickness from the circumference to the centre, which would be of great advantage in a spring made of the helical form; and if it should be found desirable that the coils should not all be equidistant, the cone can be turned in any desired shape, as a parabolic conoid, or be replaced by a cylinder: a spring of this latter description of course requires no after process of flattening, but is finished as soon as taken off the mould. The flat coiled glass springs are not so brittle as might be expected, but will bear a considerable amount of rough handling with steel forceps, and are only fractured by being bent at a sharp curve. I have given some of them upwards of four turns in one direction before they have broken."

Mr. VARLEY said, that admitting the application to be practicable, he had not quite understood what were the advantages possessed by glass over steel.

Mr. WENHAM said, the advantages were, that glass was less affected by heat than any of the metals; and that it was not affected by moisture and atmospheric influences, nor by acids, the slightest touch of which was sufficient to spoil a steel spring.

Mr. VARLEY added, that it was not affected by magnetism, as was steel; a circumstance of great importance for ships' chronometers. He thought too, that its lightness was a peculiar advantage; for once set agoing, it would more easily continue in motion. He was much pleased to hear of the equal action of these springs, the result of their perfect elasticity. The only doubt he had had was as to their durability, but this it appeared Mr. Wenham had satisfactorily met. He believed that steel made perfectly hard, would be as brittle as glass.

Mr. CHARLES FRODSHAM considered glass springs as ingenious, but useless, and not to be mentioned in comparison with those of steel. The late Mr. Arnold always repudiated any idea of their practical utility. Mr. Frodsham then exhibited and explained a model, showing the application of a glass spring which had been manufactured by Mr. James Scrymgeour, of Glasgow, in 1828, but which was useless for practical purposes. Glass was affected, however slightly, by changes of temperature; and if they had to compensate at all, it made little difference whether it were for ten seconds or a hundred seconds. It was well known that a pendulum always had a tendency to gain force, and with glass this tendency was much greater. If steel was liable to rust, glass was liable to vegetate, in addition to its being of a very brittle nature. To try its merits fairly, it should be tested as a main-spring; and no one, he thought, would attempt to make a main-spring of glass. He considered that it was absurd to talk of using shell-lac for joining pieces of mechanism.

Mr. DENISON premised that he did not very well understand the matter practically, but he felt so much interest in it that he was very glad that his suggestion in the Jury Report of the Great Exhibition had called

attention to the subject, and brought out Mr. Wenham. He had, however, made a slight mistake at that time; he had said that Mr. Dent had found some practical difficulties in the use of glass springs. Mr. Dent had since explained to him that these difficulties rather arose from his own caution, which led him to undue apprehensions. The present Mr. Dent on one occasion dropped a clock with a glass spring which did not break, although the fall broke the staff of the balance. As to Mr. Frodsham's remark, that glass was affected by temperature, that might be the case in Mr. Arnold's experiments, but they were not in possession of information as to his materials, and they did not know that his experiments were good ones; at all events it appeared that Mr. Wenham had succeeded. In saying that it made no difference whether they had to compensate for ten seconds or a hundred seconds, he thought Mr. Frodsham had fallen into an odd mistake; he did not think Mr. Loseby would agree with him there. In Mr. Dent's glass balance spring, he had no secondary, and very little primary compensation, and yet the rate was good; and if they could bring glass springs into practical use, they might do away entirely with secondary compensation. Then as to glass vegetating, of which he was not so sure, the balance of evils between that and steel rusting, he thought would be in favour of glass. As to Mr. Frodsham's last objection, that glass would not do for a main-spring, he really did not know whether it would or not, but he did not see what the remark had to do with its application to the balance-spring; he thought the best answer to all this was the fact that it really had succeeded, and one had been going twenty years which was made by the present Mr. Dent, then Mr. Rippon.

Mr. VARLEY said, glass with a melted surface would not vegetate.

Mr. WENHAM remarked, that he had recently seen a microscopic object-glass, which had been in use twenty years, and the inner side of which did not show any signs of vegetation.

Mr. GEORGE FRODSHAM said, that if Mr. Dent's experiment had proved successful, it was quite certain he would have made more than one chronometer with the glass spring. He believed it had been given up by chronometer-makers as a perfectly impracticable and useless experiment. It ought at least to have been tested at sea. Whilst only one chronometer could be mentioned as successful with a glass spring, thousands had been successful with steel springs. The great losing tendency of glass was a complete barrier to its use.

Mr. LOSEBY said, glass had been tried repeatedly, and had been found to fail. It did not maintain its rate, and when taken to sea it would be like the ancient rope of chaff, and would fall to pieces.

Mr. DENISON said, on behalf of Mr. Dent, that a chronometer with a glass spring had been at sea for years; that the parts were joined with shell-lac, and that it had answered perfectly well.

Mr. POOLE, as a practical man, said, a great defect in glass arose from the fact that it could not be drawn of an equal thickness throughout its length, and he thought it next to impossible, therefore, to get an isochronous adjustment with a glass spring.

A GENTLEMAN asked when the fall alluded to by Mr. Denison occurred, and how it was that chronometers with glass springs were not sent to the Admiralty for testing?

Mr. DENISON, on behalf of Mr. Dent, said, the fall took place a long time ago; and the reason glass springs had not been brought into more general use,

was, that they could not get workmen to use them. In reference to the use of shell-lac, it was well known that it was used for fixing the pallets of regular clocks.

A GENTLEMAN remarked that the pallet was a fixture when once placed there, whereas the balance-spring might require frequently taking out.

Mr. DENISON said, Mr. Wenham's contrivance met this difficulty. In reference to the impracticability of the application, he would just remark that the idea of its importance was not the mere fancy of some theoriser; he had made the remark on the subject in the Jury Report, simply because so many scientific gentlemen, especially from the Continent, had given so much attention to Mr. Dent's specimen in the Exhibition. He regretted much, however, that practical men should show such an aversion to the experiment.

Mr. THOMAS RESTELL said, that he had devised an improved method of compensating for the expansion and contraction of balance-springs. The inner end of the balance-spring was, as usual, fastened to the axis of the balance, and its outer end was attached to the curved arm of a lever which worked round a centre pin, fixed near the outer edge of the plate of the chronometer, from which point the curve was struck. This curved lever was merely dropped on the pin, and was kept flat to the plate by means of an adjusting screw, traversing an arc or compound lamina of brass and steel. The lever would always be kept under this slide, by the desire of the spring to return to its former curve, whatever the temperature might be. The action of this compensating arrangement was as follows: supposing the balance-spring by an increase of temperature to elongate, then the arc or compound lamina of brass and steel would be drawn inwards, or nearer to the centre, and the point of contact of the curved arm of the lever and the balance-spring would be changed, so that though the absolute length of the spring was increased, its vibrating portion would continue uniform, and thus preserve the isochronism of the spring. This, however, would not be sufficient, as loss of elasticity in the spring had occurred, independently of its elongation; but the spring having now a stronger desire to return to its own curve, the elastic force was increased in a reciprocal proportion. If when tested it was found that the compound lamina by its expansion caused the lever to take up too much of the balance-spring, then the screw of the slide would have to be loosened, and the slide removed further from the centre. On the other hand, if the compound lamina did not expand sufficiently to correct the error produced by the elongation of the spring, then the slide would have to be moved and fixed nearer the centre pin. Should contraction of the spring occur by decrease of temperature, the converse of what has been stated above would take place. The advantage of this arrangement was, that the isochronism of the spring was always preserved, for there was no liability of the arc of the spring being injured, as it was unnecessary to remove the lever to unfasten the fulcrum, and therefore the centre of motion was at all times accurately preserved, and a uniform rate maintained between the adjustment for extremes. The evils accruing from the arcs of a compound balance always proceeding inwards with greater speed than outwards, were also avoided, and thus a gaining rate at mean temperatures was prevented. With this arrangement only a plain balance was required, and therefore the cylindrical form and the equilibrium of the balance were at all times preserved. It could be applied either to a duplex lever or to any watch sufficiently good to make it worth while to apply compensation, without there being any necessity for re-

moving the spring balance, or for altering any part of the watch.

Mr. WENHAM said, that if any faith could be placed in detached experiments, glass was certainly least affected by changes of temperature. In regard to compensation, he believed that fifteen out of sixteen parts were to compensate for the loss of elasticity in the spring itself, and one-sixteenth part only for the expansion of the balance. In answer to a question, as to whether the tables shown referred merely to expansion in bulk, or to variation in elasticity, Mr. Wenham stated that they referred to elasticity.

Mr. LOSERY declined to enter further into the discussion in regard to secondary compensation, on account of the lateness of the hour; and stated that he would make some remarks through the Society's Journal.

Mr. DENISON explained, in reference to the discussion on Wednesday evening, that in one page of the Greenwich lists, the weekly sums of daily rates were arranged by the Astronomer Royal in the order of *temperature*, not of time; so that if a week in January was warmer than one in May, that week in January would be placed after that in May. It was from this page that Mr. Dent's subdivision was made. He concluded by moving a vote of thanks to Mr. Wenham, which was seconded by Mr. Varley, and unanimously agreed to.

## TWENTY-THIRD ORDINARY MEETING,

*Wednesday, June 1st, 1853.*

THE Twenty-third Ordinary Meeting of the Society was held on Wednesday, the 1st instant, the Right Hon. T. Milner Gibson, M.P., in the chair.

The following Institutions have been taken into Union since the last meeting:

268. Deptford, Institution.

269. Wisbech, Mechanics' Institute;

and the names of four Candidates for Membership were read.

The Secretary said that the Council having determined to bring before the meeting the subject of the French International Exhibition of 1855, as affecting the interests of British manufacturers, and the international commerce of the two countries, he had drawn up a brief statement which must be regarded as merely introductory, and as serving to indicate the general nature of the questions proposed for consideration. He said—

"I would in the first instance draw your attention to the announcement recently made by the French Government, and communicated officially to the Board of Trade through the French Ambassador—namely, that it is proposed to hold at Paris in the year 1855, a universal Exhibition of agricultural and industrial products, and that every possible facility will be afforded to foreign exhibitors by the various departments of the French Government. The ambassador further expresses a hope on behalf of the Government, that the attention of British manufacturers will be expressly drawn to the intended Exhibition of 1855, and that they will respond to the invitation with the same ardour, as the French manufacturers did to the British Exhibition of 1851.

"The French nation have long known and felt the practical value of Exhibitions; for many years they have held consecutive industrial expositions in which was clearly shown the progressive development of each art; and the exertions of manufacturers received that spur and stimulus, which could not fail to arise from the gratification of fame and praise coupled with increased profits, and extended prosperity. These Exhibitions were however wholly French, it was the emulation of Frenchmen—one against another—the comparison of French productions and French manufactures alone. It was reserved for our own country to propose, to arrange, and to carry out successfully—an international Exhibition, in which a trial of skill of different countries and the manufactures of different people should be made.

"The Great Exhibition of 1851 must not be regarded as a mere extension of the principle already proved and established in the previous French Expositions; the international character, which was its chief feature, gave to it a new and vastly superior importance to that possessed by any former Exhibition, because it embraced not merely the question of the progressive advance of a single country, but went at once to the relative resources, industrial energies, and consequent future powers of all the civilised countries of the globe. The international character of the Exhibition of 1851, took from it at once the aspect of a mere competition amongst manufacturers and shopkeepers, and gave to it all the importance of a great political influence. At the close of the year 1851 some of our manufacturers were heard to complain that their fears had been realized—that foreign rivals had carried off the orders which they ought to have received, and that they had gained nothing in return. The results of a great international Exhibition were not, however, to be looked for in a few months; they were to be sought for in after years, and they will surely come—all the more surely, because the changes which they produce are slow and gradual.

"The great experiment having been tried, and having proved so eminently successful in many respects, the French Government are not slow to adopt the new principle thus established; they invite the industrial world to meet in Paris in 1855, and they propose to repeat the peaceful rivalry of 1851, with all the method, science, and arrangement which matured thought and accumulated experience can suggest. They invite—nay, they almost challenge British manufacturers to come and exhibit—to meet them with the same readiness and cordiality with which they met us in 1851. The question thus naturally arises, What are the precise terms of their invitation? is it one that our manufacturers ought to accept? is it one that they can accept? And in considering these questions, we must bear in mind what are the real objects of an international exhibition, and what are the fundamental principles on which it should be conducted."

Mr. Solly concluded by pointing out the various commercial restrictions which at present interfered with the trade between the two countries, and the existence of which might, to some extent, deter English exhibitors from sending their goods to Paris.

The CHAIRMAN expressed his satisfaction at the promptitude with which the Government had given publicity to the interesting project of a great international Exhibition of Works of Industry, in France; and he thought the Society of Arts had taken a proper course in seizing this early opportunity of considering what measures might be adopted, in order that the exhibition might be as perfect as he was sure the people of England would desire. There could be no doubt, as the Secretary had remarked, that something more than a mere removal of the prohibitions at the time of the Exhibition would be required to enable the manufacturers of England to exhibit their works. Unless it could be seen that there was to be some permanency in these facilities for the introduction of our manufactures and works of art into France, one great inducement to exhibit would be absent; for if it were known that when a person exhibited his goods, showing excellence combined with cheapness, that he was to be deprived, by means of these prohibitions, of the advantage which might result from exhibiting them, a very powerful motive would be destroyed. He therefore considered it was a wise and judicious course in the Society, to give its attention to the effect which light duties and prohibitions must have on the success of the projected Exhibition. It occurred to him that this might be something like a precursor of free-trade in France; but, at the same time, they must not forget the difficulties which Governments had to contend with in bringing into effect a free-trade policy. They well knew that it was not until after a long conflict that the recent considerable relaxations had been effected in the commercial system of this country. Even now they had not accomplished fully the object of free-traders; there still remained much to be done; and whilst it might be right to comment on the prohibitions and high duties in the French tariff, it was only fair not to forget that England still imposed almost prohibitory duties on the wines of France, so as to entirely prevent the inferior qualities of wines coming into general consumption in this country. And although they might reasonably expect great changes in the direction of free-trade in France, they must not forget in making these efforts, how much remained unaccomplished in England. He made these remarks, because he knew there was a strong tendency in mankind generally, when they had accomplished, by a long process of argument, any great change in their policy, the success of which experience proved—to take it for granted that all the rest of the world ought to jump to the same conclusion. He hoped, therefore, they would remember the difficulties in regard to this question which other Governments had to encounter; the prejudices to be overcome, and the vested interests that would be opposed to it. He trusted that Englishmen would do all in their power to make this Exhibition as successful as was their own; and that the Society would leave nothing undone to bring out the greatest amount of sympathy in this country in regard to such a noble undertaking.

Mr. P. GRAHAM remarked, that a great many of the important manufactures of this country were entirely prohibited in France. Carpets wholly of wool were prohibited. Brussels, tapestry, and velvet pile carpets were charged 250 francs per hundred kilomètres. Carpets made in one piece, such as Turkey and Axminster, at the rate of 500 francs per hundred kilomètres. Furniture, of which he was a manufacturer, was charged 15 per cent. *ad valorem*, whilst with us it was only 10 per cent. He thought this discussion came very opportunely, because England was just about to make consi-

derable ameliorations in its tariff, which would be peculiarly in favour of France. As a manufacturer he might say, that he would be very glad if furniture was allowed to come in altogether free; he had no fear of the most unfettered competition. The reductions proposed by the Chancellor of the Exchequer were, in printed paper-hangings from 2½d. to 1½d. per yard; in bronzes from 10 per cent. *ad valorem* to 10s. per cwt., which would be on an average, about 2 per cent.; Aubusson carpets from 15 per cent. to 6d. per yard, or about 4 per cent.; and mixed fabrics of silk and wool from 15 per cent. to 1s. per lb., or about 10 per cent. Manufactures of goat's wool, as Utrecht velvet, which had been charged 10 per cent., were to come in free; clocks which had been 10 per cent., were to be reduced to a rated duty averaging about 4 per cent.; and coloured porcelain from 10 per cent. to a nominal duty of 10s. a cwt. As therefore we were about to make these ameliorations, he thought it a favourable opportunity for putting forth our views in regard to the influence of a high tariff on the coming Exhibition. It was difficult to understand what inducement there would be for an English manufacturer of any great staple commodity to send it to France for Exhibition when he was deprived of the benefit of any consumption of such commodity by these prohibitory duties. It was true there was the one inducement, that in exhibiting his goods in France he was not simply exhibiting them to Frenchmen, but to the whole world; as there would be assembled at that time in France, Americans, Germans, Spaniards, Russians, and others, who would then see English goods side by side with those of France, and would be able to form a fair opinion of their respective merits. There was another circumstance that should be remembered; the French hitherto in their exhibitions had not taken cheapness into account as an element of merit. They had regarded superb qualities, rich dyes, beautiful designs, and skilful execution, rather than cheapness. English manufacturers, on the contrary, gave attention to the wants of the million, and aimed at producing a good and useful article at the lowest possible price; and unless, therefore, cheapness was recognized at the coming Exhibition as an element of merit, there would be amongst English manufacturers a natural disposition to shrink from the competition. Speaking personally, he should probably, under any circumstances, send something; but speaking generally, he believed that there would be an unwillingness to exhibit unless some alterations were made in the tariff, and unless the conditions of success observed in former French Exhibitions were somewhat modified.

MR. WINKWORTH said, he was struck by what the Chairman had remarked in reference to the hesitation which persons and nations naturally had to give up a long-cherished series of opinions, whilst they were too much in the habit of taking it for granted when they had got light, that the rest of the world ought to receive it at the same time. Now of all the nations of the civilized world, none were so difficult to move in these matters as their neighbours of France. It was well known that attempts had been made more than once to induce them to open their Quinquennial Exhibitions to the subjects of other nations. They had, however, always refused, and it was therefore a great relaxation of their former exclusiveness that they were now willing to admit the products of all nations. But whilst they were willing to do this, it was still possible that they might not see or acknowledge that by relaxing duties and taking off prohibitions, their own manufacturers would be gainers.

He thought, perhaps, that a slight reference to the silk trade, in connection with which he had spent a great part of his life, might, by showing its effects in this country, have a tendency to open the eyes of that portion of French manufacturers; and, by a parity of reasoning, other manufacturers might see that there were two sides to the question of free-trade and prohibition. He was in business in the silk trade in Spitalfields at the time when Mr. Huskisson proposed to interfere with that manufacture. Up to the year 1824, the silk manufactures of other countries had been prohibited in this country. The silk manufacturers almost universally (there were a few exceptions, of which the firm to which he, Mr. Winkworth, belonged was one) resisted Mr. Huskisson's proposition for admitting them. In the year 1826, when the silk goods of other countries were allowed to come in at 30 per cent. duty, the importations into this country of raw and thrown silk were about 1,250,000 lbs. In the year 1847, the year before the French Revolution, which occasioned a disturbance in the ordinary course of trade, the importation of raw silk rose to 5,106,200 lbs. In France, during the same period, the consumption was 4,330,000 lbs., of which only 2,100,000 lbs. was of home production. So that it appeared, that between the years 1826 and 1847, the increase of English manufactured silk was fourfold, and of course there was a corresponding increase of employment for operatives. Now, it must be borne in mind that this result was obtained at the time when England was importing large quantities of silk goods of French manufacture. So great was the increase, that the trade removed from Spitalfields, and extended itself into Macclesfield, Manchester and other districts. He therefore thought, that if they went a little further they would see that this was not the only advantage which arose from the relaxation, because, if they imported goods from another country, they must pay for them in some way or other, and this had been done by the export of other English manufactures, of which the raw material cost less, and the same amount of capital being spread over a larger surface of labour was, as far as the operatives were concerned, highly beneficial, and productive of increased advantage to this country; and thus, either to France or through France, more had been exported than had been received. Another advantage was also gained: when trade was bolstered up by prohibitory duties, nations cultivated a trade in articles at a great expense to the consumer, which might be purchased at a much lower rate from countries possessing greater local facilities for their production; whereas, in consequence of these relaxations, each country produced that article for which it was peculiarly adapted, and by a general free exchange advantage was gained by all. Thus in England they found that plain goods were an article of large manufacture, whilst in France they had greater facilities for the production of fancy goods. Now, by free trade they would learn in what direction these advantages might be best attained, and thus cheapness and excellence would be the result. He hoped France would receive this statement, and analyse it, as an instance of what would be the case in other manufactures besides silk; and in reference to it he ought to add, that many of those silk manufacturers who in 1824 objected to Mr. Huskisson's scheme for admitting foreign silk at all, were now petitioning the Government that the duties imposed might altogether cease.

MR. SIDNEY doubted whether it was the duty of the Society of Arts to discuss this question, it being one essentially belonging to political economy. It must be remembered, too, that the question of free-trade was not

new to France; M. Turbot and M. Bastiat had written more ably on the question than any English writer, but without producing much effect on the French nation. If English manufacturers sent goods to this exhibition, and showed they could manufacture them cheaper than the French themselves, that might have a beneficial influence on the people. A cheap carpet or a cheap plough would attract their attention, and would be a free-trade argument they could understand. On the other hand, any attempt to persuade them to alter their tariff would be regarded as one of the tricks of *perfidie Albion*, and would do more harm than good; and if English manufacturers declined to send goods unless these restrictions were removed, the French would simply answer, "We can get a good Exhibition without you."

MR. MARSHALL apprehended that the question was not one of tariff at all, but what was best to be done to promote the coming Exhibition at Paris. He submitted their business was to inquire whether—however slowly they had arrived at their present position, as they were progressing towards the right goal—it was not their duty in a frank spirit to communicate any measure of light they might have on the subject? If the Parliamentary debates on the question of free-trade were examined, it would be seen how slowly they had advanced towards a right appreciation of the subject, and they would be convinced that they were in no position to cast stones at France, or any other country, in reference to it. He believed the time was not far distant when France would see that her interests were interwoven with free-trade, and that every Exhibition of this kind, promoting as they did intercourse among nations, was step by step producing those results which would sweep away all commercial prohibitions. Whatever might be the decisions of France, he hoped that no prejudices about tariffs would be allowed to interfere with the success of this great undertaking. He felt persuaded that English manufacturers would send their goods for exhibition, and if not sold there, be quite content to bring them back and sell them elsewhere.

MR. VARLEY observed that evil would never be overcome by evil, and advised English manufacturers to look to the generous side of the question. It would be worthy of the English people to accept the invitation, even if France made no relaxation in her tariff.

MR. J. BENNETT remarked that it would be impossible to be generous without gaining advantage at the same time. Even if English manufacturers found their goods inferior when placed beside those of French manufacturers, they must be benefited by the competition. He referred in illustration of this to the effect of the Great Exhibition on the manufacture of English watches and clocks, when their deficiency in point of taste and ornament, as compared with those of Continental workmanship, was strikingly manifest; but by it an impetus had been given to improvement in that direction, such as nothing else could have produced. The English trade in these departments, so far from having been injured, was now so brisk that every watch made could be sold in foreign markets, if they were not required for home use. He referred to the advantage of the division of labour in that trade, and stated that a common verge movement could be bought for 7*d.* in France, whereas here the same movement would cost 2*s.* 6*d.* or 3*s.* 6*d.*; the difference being solely attributable to the greater subdivision of labour adopted on the Continent in this branch of trade than was the case in England. In hardware the very opposite was the case: for instance, at Sheffield a knife would pass through ten or twelve hands,

whereas in Paris, probably not more than one man would be concerned in the production of such an article, except, perhaps, that the handle might be made by another person.

MR. HENRY COLE, C.B., made some remarks justifying the course the Council had taken in bringing this subject forward, observing that political economy, so far as it affected commerce and arts, was most decidedly within the scope of the Society's objects, and its consideration one of their primary functions. In reference to the idea of an international exhibition having originated with England, he thought their Secretary was to some extent in error, for he held in his hand a Report which contained a letter from M. Buffet to the Chamber of Commerce, Paris, in which the germ of that idea was contained. M. Buffet said, referring to the National Exhibition of June 1st, 1849, then in course of preparation:—"It has occurred to me that it would be interesting to the country in general to be made acquainted with the degree of advancement towards perfection attained by our neighbours in those manufactures in which we so often come in competition in foreign markets. Should we bring together and compare the specimens of skill in agriculture and manufactures now claiming our notice, whether native or foreign, there would doubtless be much useful experience gained; and above all, a spirit of emulation which might be made greatly advantageous to the country. You will therefore first give your opinion on the abstract principle of exhibiting the productions of other countries; and should you consider the experiment ought to be made, to enumerate to me officially the articles you consider would most conduce to our interest when displayed at the ensuing Exhibition. . . . The experiment we are about to make, if I am well informed, has been already tried in two exhibitions, undertaken some years ago by the Chambers of Commerce at Lyons and Mulhausen. The example thus given in the provinces will doubtless be worth following on a more extended scale." The idea seemed clearly developed there, but the French people in 1849 were not disposed to work it out.

MR. LAVANCHY deprecated any interference with the tariff question. There was not at that moment a Chamber of Commerce in which it was not under discussion, and any attempt to precipitate the question would certainly act injuriously, and embarrass the rulers of France. They would, moreover, postpone by interference what he believed to be very near at hand. As to English manufacturers sending goods to the Exhibition, he thought no man with the slightest regard for the good of the community would have any hesitation, because it would be in reality submitting them to the world, and not simply to France.

DR. FOUCHER, a German free-trader, said, he was reminded of an occasion some time ago, when he occupied the place the Secretary then occupied, at a meeting of a Society in Hamburg, when the question to be considered was the Great Exhibition of 1851. He had just thought what would have been the case then if they had entered into a similar comparison as that which had been instituted during this discussion. In Hamburg they had no tariff; and the comparison with England would not therefore have been favourable, if they had made that a consideration. In Switzerland and in the Northern States of Germany there were no prohibitory duties; still that did not prevent their exhibiting in Hyde Park. Why then should England make this a condition whether she should or should not send her goods to Paris? The question of free-trade appeared to him

simply a question of stupidity, and he did not think it wise to tell any people of its stupidity. England would not have liked other nations to interfere to tell it how stupid it was in the matter of free-trade; and France was more jealous of foreign interference than even England.

The CHAIRMAN, in rising to propose a vote of thanks to Professor Solly for his interesting paper, said, the question before them was not whether any step should be taken to represent to the French Government any particular views as regarded their commercial policy, but simply to consider if they could suggest anything to promote the success of the projected Exhibition. They wanted to see it successful, and if any one thought there was anything in the tariff or customs' regulations of France calculated to mar the success of the Exhibition, and mentioned that temperately, not in a spirit of dictation, he thought that such a course would promote rather than injure the project. He therefore felt that there was nothing in the discussion of such a subject that was not strictly within the province of the Society of Arts, Manufactures, and Commerce. He concluded by moving a vote of thanks to the Secretary, which was passed unanimously.

The Secretary announced that at the Meeting of Wednesday, June 8th, the Council would render an account of their proceedings for the past year, and the Auditors would present a statement of the Receipts and Expenditure during the same period.

The Secretary likewise stated that the Annual Dinner of the Members of the Society, of the Representatives of the Institutions in Union, and their friends, would be held on Thursday, the 9th instant, after the Conference between the Council of the Society and the Representatives of the Institutions. Also, that the Directors of the Crystal Palace Company had invited the Members of the Society and the Representatives to inspect their grounds and works on the morning of the following day, Friday, June 10th. On the same day (Friday), at half-past four o'clock, P.M., the Annual Distribution of Medals and Premiums will take place, at which His Royal Highness Prince Albert, K.G., the President, has graciously consented to preside.

#### NOTICE TO INSTITUTIONS.

THE attention of the Institutions in Union is particularly directed to the subject of the Circular which follows this notice. That Circular has been issued to the principal publishers and booksellers of the United Kingdom, and will be sent on application to any others.

Society of Arts, Manufactures, and Commerce,  
Adelphi, London, May 14th, 1853.

SIR,—The Council of the Society of Arts, Manufactures and Commerce, has directed me to address to you a proposal on behalf of the Literary, Scientific, and Mechanics' Institutions, which have been taken into Union with this Society. The object of this Union, and some of the modes by which those objects are to be pursued, may be gathered from the enclosed statement.

265 Institutions have already been united to this Society, and their number is constantly increasing. A great many of the Institutions have requested the Council to organize a plan for affording to them through the Society such advantages in purchasing books and maps at greatly reduced prices, as are afforded by the Education Committee of the Privy Council to the schools in union with that Committee.

The Council of the Society of Arts does not doubt that the Publishers and Booksellers of the United Kingdom feel a liberal interest in the Literary, Scientific, and Mechanics' Institutions, and will co-operate in any suitable arrangements for enabling them to improve their libraries consistently with the ordinary customs of trade.

It is understood that the arrangements which many of the most eminent Publishers have made with the Privy Council for the supply of books and maps to Schools, have, directly or indirectly, had a beneficial operation, not only on the Schools, but also upon the interests of the publishing and bookselling trades, and it is now proposed by this Society that very similar arrangements should be made for supplying their Institutions with books and maps.

It has been ascertained that in many instances the Institutions already enjoy at retail purchases the benefit of large reductions on the publishing price; so that in order to make it worth their while to combine for the purpose of purchasing wholesale through this Society to an adequate extent, it would be requisite that the wholesale reduction of price should be very considerable indeed; certainly not less than that obtained by the Privy Council, which is understood to average 43½ per cent.

It is unnecessary to point out what a powerful stimulus would be given to the publishing and bookselling trades, if the 800 Institutions which are established in all parts of the United Kingdom were supplied even tolerably with books; a very considerable reduction in their price would at once augment and improve the libraries of the Institutions, and, by so doing, increase their means of attraction, their number of members, and their funds applicable to the purchase of books. To encourage a taste for reading is to multiply the purchasers of books.

The plan which the Council of this Society proposes to adopt is as follows:

1. The Institutions in union with the Society will send in to the Society monthly (say by the 15th of each month), a list of the books which they wish to purchase.
2. The orders will be given wholesale to the publishers or booksellers by the Society monthly (say on the 19th of each month).
3. The publishers or booksellers will deliver the book, carriage paid, monthly (say the last day of the month), at the Society's office, or at the Society's Agents, as the Society may determine.
4. Payment will be made by the Society on the delivery of the goods.

I am directed to request, that if you are disposed to enter into such an arrangement as this, you will be so good as to inform me, before the 1st of June next, what reduction per cent. from the selling price you will be willing to make to the Society for its united Institutions, upon, 1st, The whole of your own publications; 2nd, Publications not your own. For the sake of simplicity, it is desirable that only two rates of reduction should be stated.

Whether you enter into the proposed arrangement or not, you on the one hand, and the Institutions on the other, will of course be perfectly at liberty to carry on direct dealings without the intervention of the Society.

I enclose a copy of the Society's Journal, which is published weekly, and sent gratis to every member of the Society, and to every Institution in Union. It is thought that it would be convenient to those publishers who may enter into the arrangement which I have described, if their names were published in this Journal, and their several rates of reduction were communicated to the Institutions. The publishers would then probably find it convenient to forward their priced catalogues to



the Institutions, in order that they might know what books to purchase.

A List of the Institutions in Union would be supplied from time to time for this purpose.

I am, your obedient Servant,

EDWARD SOLLY, *Secretary.*

#### LIVERPOOL MECHANICS' INSTITUTION.— INDUSTRIAL INSTRUCTION.

[*From the Liverpool Mercury.*]

TO THE WORSHIPFUL SAMUEL HOLME, ESQ., MAYOR  
OF LIVERPOOL.

Mount-street, 23rd May, 1853.

MR. MAYOR,—I observe in the *Albion* newspaper of this morning a letter addressed to your Worship by the Principal of the Collegiate Institution, on the subject of Industrial Instruction; and as public attention is again, and through another channel, emphatically called to the question, I think I should not be discharging my duty to the Institution I am privileged to serve, if I failed to submit to your notice, without further delay, the steps which have been already taken, and the proceedings which are immediately contemplated, by the Directors of the Mechanics' Institution in regard to this important movement.

In order to show you that the attention of the Board has, for some time past, been closely directed to the means of providing superior facilities for the education of the great mass of the people engaged in commerce and in the mechanical arts, I need only refer your Worship to the Report adopted at the Annual Meeting of the Members of this Institution, held on the 9th March last, from which the following is an extract:

During the last year a very important measure has been carried into effect; namely, the union of the great body of provincial Institutions with the Society of Arts in London, of which his Royal Highness Prince Albert is President. This union now consists of 268 Institutions, including the Liverpool Mechanics' Institution, and its object is to afford to those widely-scattered establishments the utmost attainable facilities for the prosecution of all objects possessing a common interest, by means of an efficient and influential agency in London. Through this channel several important gifts have already been obtained for the library, and the Directors cannot doubt that benefits of the most important character are yet destined to flow from it.

The Society of Arts—the parent, it will be remembered, of the great Industrial Exhibition of 1851—has lately appointed a Special Committee from its Council to consider the question of industrial instruction, and to negotiate with the Government and the various educational establishments throughout the country, with the view of procuring measures to be adopted to secure to the great body of the people, not merely a better and more practical general education than is usually afforded in public schools, but such special kinds of instruction as are so eminently necessary to enable the different classes of artisans to prosecute their several callings with due efficiency and success. The Directors have had various communications on this important subject with this Committee of the Council of the Society of Arts, in reference to the day-schools as well as to the evening department. They are glad to find that her Majesty's Government is expected to move in this matter during the present session of Parliament; and they need hardly say that they have considered it to be their duty to assure the Committee of the Council of the Society of Arts of their most cordial co-operation and sympathy with this movement.

It was for the purpose of affording to all classes of the community, and to young and old alike, the means of acquiring an education of that peculiarly real and practically useful character which is now not inaptly termed industrial instruction, that the Liverpool Mechanics' Institution was established twenty-eight years ago; and

it has been in promotion of this primary object that all subsequent measures in connection with it have been adopted. In struggling for the accomplishment of its object, much has undoubtedly been effected by the Institution, although much more still remains to be done. There is no other Institution of this kind in the country which can boast of having afforded systematic instruction in its several schools to about 11,000 individuals within the comparatively short period of eighteen years; and if its progress in some sense has only been from difficulty to difficulty, it cannot but be gratifying to its friends and supporters to feel that efforts such as theirs, instead of being regarded with suspicion and distrust, are now considered identical with the common weal, and are appreciated as worthy of the co-operation and support of a liberal and enlightened Government.

The Board of Directors must not be understood, however, from the tenour of these remarks, to be in favour of any scheme for converting such establishments into schools to be managed or controlled by the Government. On the contrary, they believe that such a change would prove in the highest degree injurious. There must be no interference with the independent action of those Institutions; they must be self-governing, and they must also be self-supporting. But it is quite possible, as the Directors believe, that the Government may do very much to encourage local efforts, and to stimulate to further exertions, without infringing these important principles, or compromising in any way the position or management of the Institutions. And it is precisely this which those who ought to have the best means of knowing seem to believe it to be the intention of the Government to attempt. If these anticipations are well-founded, and if Parliament shall assent to any plan for offering certificates, prizes, exhibitions, and scholarships, to be competed for by pupils after they have completed, in these Institutions, certain clearly-defined courses of study,—and if, in addition, a few lectureships can be instituted, for limited periods, to provide instruction in particular subjects, for which remunerative classes cannot at once be organised,—then the long-cherished idea of an Industrial College may be completely realised, and a range of usefulness opened for the Liverpool Mechanics' Institution both higher and wider than it has ever yet approached.

It will be for the Board of Directors now to be appointed to watch the proceedings of Parliament in reference to this most important question, and to take such steps as may be found necessary to secure to this Institution whatever advantage is to be gained from any legislation on the subject. There is no want under which our country suffers so seriously as the want of a widely-diffused system of really practical instruction; and, apart altogether from higher considerations, it may be truly said, that there is no question on which our future progress, even as an industrial community, so much depends, as the extent to which we may succeed in providing for the better education of the great body of our people. The fact is established beyond the reach of contradiction, that among the other nations in central and western Europe much greater attention has been bestowed than with us to secure for persons devoted to the mechanical and decorative arts especially, a suitable degree of training and instruction; and the consequence is, that, notwithstanding the enormous advantages we enjoy in our inexhaustible mineral wealth, and the indomitable energy of our people, these nations are, by reason of the superior intelligence of their workmen, already competing with us, with daily increasing success, in the production of articles for which they have to come to us for the raw material, and in the manufacture of which we have hitherto enjoyed a monopoly. Surely this is a state of matters which may not longer be regarded with indifference; for, as sure as the struggle has commenced, it will become daily more severe, and that nation can alone be ultimately most successful which shall most earnestly apply itself to the cultivation of knowledge and refinement.

Since that period this important subject has been diligently prosecuted by the Board of Directors. A correspondence was opened immediately after the above date with the Department of Practical Science and Art in connection with the Board of Trade; and on Tuesday

last Dr. Lyon Playfair visited Liverpool, at the request of the Directors, when he inspected the several schools connected with this Institution, and when the leading features of a comprehensive scheme for the accomplishment of the objects in view were fully discussed, and all but definitely arranged.

It is well known to the public of Liverpool, that in the schools connected with the Mechanics' Institution a much more extended course of instruction in science has been afforded than was at all known in public schools at the time when they were established, or than is yet ordinarily admitted. In this respect, therefore, but little remains to be done; but the Directors are keenly alive to the great importance of affording an education of at once a higher and more practical character than can be given in any ordinary day-school, and they are now engaged in organizing a department for the reception of pupils who may be disposed to carry their studies further, and to offer extended courses of instruction in Applied Mathematics, including the various operations of accounting; in Physical Geography, including mineralogy and a knowledge of the available products of various countries; in Practical Chemistry, including commercial testing; in Political Economy, including commercial statistics and international law; in Mechanical Philosophy, including the arts of construction, the knowledge of materials, &c.; in Modern Languages; and in Free-hand Mechanical, Architectural, and Ornamental Drawing.

It is proposed to establish classes for these subjects as supplementary to the existing schools, and to add to the already extensive and valuable Museum belonging to the Institution such collections of raw produce and manufactured articles as may serve amply to illustrate the most comprehensive courses of practical instruction.

I regret that I am obliged to trouble your Worship with a reference to schemes which are in any degree immature; but I beg you to believe that the Directors of this Institution, relying upon the sympathy of their fellow-townsmen, which, during an experience of twenty-eight years, has never hitherto failed, will leave nothing unattempted in the establishment over which they preside which may be necessary to realise, in its fullest extent, the idea of a Commercial and Maritime Institute and School of Arts.

I have the honour to be, Mr. Mayor, your most obedient humble Servant,

W. NICHOL, *Secretary.*

The following reply has been received from his Worship:

TO W. NICHOL, ESQ., SECRETARY, MECHANICS' INSTITUTION.

Town-hall, Liverpool, May 24, 1853.

SIR,—I beg to acknowledge the receipt of your letter of yesterday, which I have read with unusual interest. I am obliged by the information which it contains, and shall endeavour to make myself master of the general subject to which it refers.

I have accepted an invitation from the Lord Mayor of London, to be present at the Mansion-house on the 7th of June, when the subject of Industrial Education will be considered by those most likely to furnish information, as well as by the Municipal representatives who will then be assembled.

Committed as our country is to a course of policy which has thrown down the gauntlet to the world, it is clear that we must instruct the community, and particularly our artisans, how they may best avail themselves of those advantages with which a beneficent Providence has endowed our land.

I am, Sir, your faithful and obedient Servant,  
SAMUEL HOLME.

## HOME CORRESPONDENCE.

### LECTURES.

16, Granville-square, Pentonville, May 30th, 1853.

MY DEAR SIR,—The pressure of occupations which frequent absence from town during the last three months had compelled me to lay aside for a time, has only now left me leisure to make a few remarks in reference to the Lectures I have recently delivered at some of the Institutions in Union with the Society of Arts. I address these remarks to yourself, both because I am aware of the active interest you have felt in the formation of the Union, and because my own connection with it, in the task of lecturing, originated with yourself.

I have visited, since the early part of March last, twenty-two different provincial Institutions:—at widely scattered points, between Durham to the northward and Folkstone in the opposite direction. Some of these visits have been made at much personal inconvenience, and upon conditions in which I chiefly acquiesced from a strong desire to do my best towards carrying out the objects of the Union, and a determination to make the experiment of doing so in a liberal spirit.

On the whole (with one or two exceptions) the Lectures have been well attended:—in some cases very numerous, and in nearly all instances to an extent which appeared to meet the expectations of those engaged in managing the respective Institutions, who were of course better judges on this point than a stranger could be. Great attention has been paid to the lecture—an attention the more gratifying inasmuch as my subjects admitted of no adventitious means of exciting the interest of an audience, and had no other illustrative help than that derived from a few large maps and diagrams. I believe I may appeal to the experience derived from these visits in confirmation of the opinion that lectures which treat of scientific subjects, and which aim at being instructive, may yet be made popular and interesting. It might seem merely egotistical in me to make such appeal, were it not that in many instances a strong desire has been expressed that my visit should be repeated on a future occasion.

In regard to the numerical attendance upon lectures, very much depends (I am convinced) upon the average quality of the lectures that are delivered—much more than upon the merits of any one or two particular lectures. I mean, that if common-place and inferior lectures are customarily delivered, the entire matter of lectures falls into disrepute, and they become regarded as things of dull and prosy routine. I believe that the recommendation to have "*fewer lectures, and those better ones*" would embody the soundest advice that could be given to the great majority of Institutions. In this respect, I incline to think that the facility with which gratuitous lectures are obtainable by many Institutions has been productive of dis-service to the whole system of public lecturing. I could mention (were it not that I intentionally refrain from doing so) more than one Institution in which I have had reason to think such a result observable. In some such cases, it will (not unnaturally) be found that lecturing comes to be regarded as a matter of very ordinary description—a lecture being a thing that anybody can "get up" for the occasion, and that is at any time readily obtainable from Mr. A. or Mr. B., as the necessities of the case may demand. I feel considerable delicacy in expressing my

opinion on this point, and for an obvious reason, though my doing so is dictated by no other than disinterested considerations.

I believe it to be, in many cases, a mistake to confine the lecture-session to so short a period of the year, and to crowd all the lectures within so brief a space. I know it is commonly said that the members will only come to the lectures during the winter months; but I doubt the fact. It may be so in the case of large towns, but I am convinced that it is not so in all instances. Only ten evenings since, I addressed a numerous and highly attentive audience at an Institution in Kent (Sevenoaks), and have undertaken to lecture there again in the course of the following month (June). At this Institution, they have a lecture at intervals of three weeks, all through the year: and the lecture-evenings, I am informed (and certainly my own limited experience corroborated it), are looked forward to with much interest. I incline to believe that a medium between this practice and that generally adopted (of limiting the lecture-session to the months between October and March) might be adopted with advantage in a great number of instances.

In the intercourse I have had with the secretaries and Committees of the Institutions I have visited, the conversation has naturally adverted, in most cases, to the Society of Arts, and the Union of which it constitutes the centre. I may state, as the general result of the impressions I have thence been led to form, that there appears to exist a strong desire that the Society of Arts should undertake the task of organisation (in reference both to the order and the subjects of Lectures) much more fully on future occasions than was done in the recent session. In more than one instance I have heard disappointment expressed, that of several subjects selected from the schedules issued by the Society, my own was the only one that had been productive of any result. I have pointed out that this seemed a necessary consequence of the fact, that such subjects had only been selected by isolated and distant Institutions, and that the terms of remuneration by which the selection had been accompanied had been inadequate to the purpose. But it has almost uniformly been replied, that other Institutions, in the neighbouring towns, would no doubt have readily (and gladly) acquiesced in an arrangement for the reception of the same Lecture on successive evenings, if the Society of Arts had intimated (at a period sufficiently in advance) a desire that such should be made. Or, in other words, if the Society of Arts had said to the Institutions in a particular locality, "Mr. A. or Mr. B. is prepared to visit you, to lecture on a certain subject, provided your own and certain neighbouring Institutions will agree to receive his Lectures on so many successive evenings," it would seem (judging from the conversations I refer to) that the arrangement might readily have been made. The three neighbouring Institutions of Warwick, Leamington, and Coventry, form a case in point. I visited Warwick merely to lecture *there*, and there only; but I was assured that there could be no possible reason why the three places should not receive the same Lecture on three successive nights, and that there would be no difficulty in carrying out such a scheme. A very general desire appeared to me to prevail, in similar cases, that the Society of Arts should take the initiative in making such arrangements.

How far the Society of Arts can go in such a matter, I do not know, nor do I stop to inquire. I merely record the impression which recent experiences have led me to receive, and I do so because I believe it may not be uninteresting to yourself and the gentlemen who have acted

with you, and because I feel really interested in the cause you have taken up.

I must apologise for the length to which this letter has extended; and am, my dear Sir,

Yours faithfully,

WILLIAM HUGHES.

Harry Chester, Esq.

## PROCEEDINGS OF INSTITUTIONS.

ANNAN.—The Fifth Annual Meeting of the Members of the Mechanics' Institute, was held on Wednesday, April 27th. The Report of the Committee states, that there has been an increase of fifty during the past year, in the number of Life, Honorary, and Ordinary Members, but that there has been a falling off in the number of Apprentices and Lady Members; so that the absolute increase is only twenty-five. The library has been increased from 740 to 934 volumes, and the number of exchanges has been 4,695 against 3,848 in the preceding year. The average number of readers per quarter has been 173. The Committee attribute much of their present prosperity to the News-room in connection with the Institution, which has been opened about fifteen months. It is supplied with upwards of thirty papers in the week, and is well frequented. During the winter, a course of twelve lectures was delivered, which were better attended than in any previous year; and in addition to the winter course, the Rev. James Mackenzie, of Dunfermline, delivered two lectures upon "Rome in 1852." A Literary, Scientific, and Discussion Class, for the mental improvement of those who avail themselves of it, has been renewed with success. The Treasurer's statement of accounts show an income of 111*l.* 14*s.* 8½*d.*, and an expenditure of 89*l.* 19*s.* 9½*d.*; leaving a balance in hand, of 21*l.* 14*s.* 11*d.*

## TO CORRESPONDENTS.

*Notice.*—Members, and others, who can furnish or obtain original information or suggestions on the subjects included in the Society's Premium-list, or other topics connected with the Society's various departments of operation, are invited to communicate the same to the Secretary, in as condensed a form as possible, for the purpose of being either read and discussed at the evening meetings, or inserted in the Society's weekly Journal. Anonymous letters cannot be attended to. All communications, whether the author's name is to appear or not, must be accompanied by the writer's name and address.

Members of the Society who do not receive the JOURNAL regularly, are requested to give immediate notice to the Secretary; and, in order to prevent mistakes, they are particularly requested to signify any change which they desire to have made in their address, with as little delay as possible.

*Country Institutions.*—Correspondents who are so good as to send reports of proceedings of Local Institutions, are requested to forward them immediately after the Meeting to which they refer, and not later than Tuesday morning, if intended for insertion in the following Friday's Journal.

## MISCELLANEA.

MONUMENT TO SIR ISAAC NEWTON.—The Mayor and Town Council of Grantham propose to erect a statue of Newton, in an open space, at the south entrance to the borough. The statue will look towards the birth-place and home of the philosopher, which was within the ancient boundaries of the borough. The ground is already in preparation at the expense of

the Town Council. The proposal has met with general approval, and has received the sanction of the Royal Society; and it is said a natural desire has been evinced that the undertaking should be worthily carried out, so as to make the statue a National Memorial.

THE MUSEUM OF ORNAMENTAL ART AT MARLBOROUGH HOUSE.—The numbers attending, &c., during the month of May, were as follows: 7,759 persons on the public days, and admitted free; 851 persons on the students' days, and admitted as students on the payment of 6d. each, besides the registered students of the classes and schools.

## PARLIAMENTARY REPORTS.

### SESSIONAL PRINTED PAPERS.

- Par. No. *Delivered on 24th, 25th, and 26th May, 1853.*  
 449. Harwich Election—Report from the Committee.  
 463. New Ross Election—Minutes of Evidence.  
 467. Harwich Election—Minutes of Evidence.  
 511. Dockyard Appointments—Report from Committee.  
 487. Schools—Returns.  
 501. Isle of Man—Return.  
 520. Committee of Selection—Eleventh Report.  
 345 (1). Tynemouth Election—Index to Minutes of Evidence.  
 398. Colonial Expenditure—Return.  
 461. Sugar, &c.—Return.  
 499. Library of the Legislative Council and Assembly of Canada—Copy of Letter.  
 500. Bills—Westminster Bridge.  
 510. „ —Succession Duty.  
 517. „ —Hackney Carriages (Metropolis), as amended in Committee, and on consideration of Bill as amended.

#### *Delivered on 27th May.*

191. Local Acts—Reports of the Admiralty.  
 470. Plymouth Election—Report from the Committee.  
 395. Sheriff Courts (Scotland)—Abstract Return.  
 301. Corn-grinding Machinery—Papers and Correspondence.

#### *Delivered on 28th and 30th May.*

498. Dr. Reid—Return.  
 412. Convicts and Convicted Misdemeanants—Abstract of Returns.  
 399. Presbyterian Church (Ireland)—Correspondence.  
 479. Indian Territories—Second Report from Committee.  
 261. Civil Services Estimates—General Abstract.  
 383 (1). Athlone Election—Index to Minutes of Evidence.  
 506. Metropolis Turnpike Roads—Twenty-seventh Report of Commissioners.  
 526. Committee of Selection—Twelfth Report.  
 529. Dockyard Appointments—Copy of an Order in Council.  
 527. Bill—Copies of Specifications Repeal.  
 Turnpike Trusts—Reports of the Secretary of State.  
 Public General Act, Cap. 16, 17, 18, 19, 20, 21, 22, 23, 24, and 25.

#### *Delivered on 31st May.*

434. Small Pox and Vaccination—Copy of Letter, &c.  
 512. Public Health Act—Return.  
 523. Sheeps' Wool, &c.—Returns.  
 532. Hackney Carriages (Metropolis)—Return.  
 536. Select Committees—Return.

#### *Delivered on 1st June.*

497. Plymouth Election—Minutes of Evidence.  
 535. Bill—Battersea Park.  
 Census of Great Britain, 1851—Population Tables, Vol. I.

## PATENT LAW AMENDMENT ACT, 1852.

### APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

*From Gazette, 27th May, 1853.*

*Dated 14th April, 1853.*

905. T. Haigh—Cleansing-pans, &c.

*Dated 19th April.*

943. F. H. Smith—Cleansing tubular boilers, &c.

*Dated 21st April.*

959. T. Dunn—Steam-boilers, &c.

*Dated 23rd April.*

981. H. Houldsworth—Combing cotton, &c.

*Dated 28th April.*

1029. J. Hetherington—Combing cotton, &c.

*Dated 6th May.*

1113. T. Murray—Machine for hoeing, cutting, &c., turnips, &c.

*Dated 11th May.*

1155. J. Brett—Electric telegraph. (Partly a communication.)  
 1157. S. C. Lister—Treating wool, &c., previous to spinning.  
 1159. H. P. Burt—Portable houses.  
 1161. J. Mottram—Washing ores, &c.  
 1163. J. Bottomley—Textile fabrics.  
 1165. A. Bird—Communication between guard and driver.  
 1167. E. Whittaker and J. Walmesley—Manufacture of pipes, tiles, &c.  
 1169. G. Bell—Liquid cement and pigments.  
 1170. A. Matthews—Disengaging boats from ships.  
 1171. W. Bull—Direct acting steam-engines.

*Dated 12th May.*

1173. J. Parkes—Stop-cock for gases.  
 1175. J. Denton—Machinery for looped fabrics.  
 1177. J. Bernard and E. T. Bellhouse—Pressing and extracting fluids.

*Dated 13th May.*

1178. C. Pooley—Feeding-machines, for opening, cleaning, &c., cotton, &c.  
 1179. J. S. Eidmans—Umbrellas, &c.  
 1180. J. Arrowsmith—Turntable.  
 1181. G. Bertram—Paper manufacture.  
 1182. G. Stiff—Paper-machine.  
 1183. W. Thomas—Weaving narrow fabrics for binding.  
 1184. C. Tetley—Rotatory engines.  
 1185. R. S. Bartlett—Sewing-machines.  
 1186. R. A. Brooman—Hats. (A communication.)  
 1187. E. T. Bellhouse—Steam boilers.

*Dated 14th May.*

1189. R. Eades—A metallic wheel.  
 1190. G. F. Russell—Disengaging ship's boats.  
 1191. G. Coppock—Looms.  
 1192. J. Browne—Construction of chimnies, and apparatus for consuming smoke, &c.  
 1193. J. Higgin—Printing and dyeing, and substances used.  
 1194. T. S. Holt—Steam-engines.  
 1195. M. Poole—Machine for pegging boots and shoes. (A communication.)  
 1196. H. D. Mertens—Preparation of materials for making beer, &c. (A communication.)  
 1197. W. J. Warner—Dry gas-meters.  
 1198. F. M. Jennings—Softening and improvement of wool, silk, feathers, &c.  
 1199. J. O'Keefe—Watch-cases.  
 1200. S. Garrett—Preparing and tanning skins, &c.  
 1201. P. A. Le Fontaine-moreau—Steam-engines. (A communication.)  
 1202. P. A. Le Fontaine-moreau—Steam-boiler. (A communication.)  
 1203. J. D. Brady—Knapsacks.  
 1204. R. W. Swinburne—Machinery for glass manufacture.  
 1205. E. Rolt—Pianofortes.

*Dated 16th May.*

1206. J. J. J. Jamin—Boots and shoes.  
 1207. J. E. Barse—Grease for lubricating.  
 1208. T. Richardson—Manufacture of compounds containing phosphoric acid.  
 1209. R. Boyd—Weaving.  
 1210. W. S. Tizard—Dredging-machines.  
 1211. M. H. Phillips—Gun.  
 1212. G. Jones—Ventilating mines.

*Dated 17th May.*

1214. C. J. Pownall—Preparation and treatment of flax, &c.  
 1215. J. L. Stevens—Grates and stoves.  
 1216. J. Webb—Rotatory engines.  
 1217. J. T. G. Vizetelly and H. R. Vizetelly—Printing-machines. (A communication.)

*Dated 18th May.*

1220. C. Cowper—Combing wool, &c. (A communication.)  
 1222. J. Haskett—"Ferdinand Martin safety-anchor." (A communication.)  
 1224. W. Rye—Kitchen ranges.  
 1226. R. Thompson—Making perforated building stone.  
 1228. J. Barsham—Drying bricks, &c.  
 1230. E. T. Simpson—Manufacture of manure.  
 1232. W. Gossage—Alkali from common salt.  
 1234. B. Newton—Mats.  
 1236. E. Briggs—Pile fabrics, and machinery for same.

## WEEKLY LIST OF PATENTS SEALED.

*Sealed 26th May, 1853.*

Year, 1852.

889. George Augustus Huddart, of Brynkir, Caernarvonshire—Invention of an improved manufacture of artificial flies.

*Sealed 27th May, 1853.*

891. Henry Winton, of Dove-mills, Cleveland-street, Birmingham, and Francis Parkes, of Sutton Coldfield Park, Warwick—Improvements in the manufacture of agricultural and horticultural forks, and pronged or toothed instruments and hoes.

928. William Morris, of Westminster—Improvements in the production of motive power, and in apparatus pertaining thereto.
983. John Henry Johnson, of 47, Lincoln's-inn Fields, and Glasgow—Improvements in weaving carpets and other fabrics, and in the machinery or apparatus employed therein. (A communication.)
1027. William Sorrell, of Kingsland—Improvements in furnaces and fireplaces for consuming smoke.
1061. Phillipe D'Homme, of Paris—Improvements in the manufacture of window-blinds, curtains, and hangings. (A communication.)
1138. Thomas Vicars, senior, and Thomas Vicars, junior, of Liverpool—Improvements in baking-ovens and apparatus for placing the bread, biscuits, or other articles to be baked therein.

Year, 1853:

127. John Sheringham, of 24, Edwardes-square, Kensington—Improvements in stove-grates.
151. Abraham Anton Meijssenheijm Knipsehaar, of the Hague—Invention of an illuminated night clock.
380. Charles John Burnett, of Edinburgh—Improvements in apparatus or mechanism for driving machinery through the agency of water.
427. Charles Kinder, of Chesterfield—Improvements in mantel or chimney-pieces.
487. Joseph Brandeis, of Great Tower-street—Improvements in the manufacture and refining of sugar.
544. John Hinks and George Wells, of Birmingham—Invention of a new or improved metallic pen.
575. Augustino Carasio, of Genoa, now of Montague-street—Invention of an hydrodynamic battery, or new or improved electro-magnetic apparatus, which, with its products, are applicable to the production of motive-power and of light and heat.
662. John Bottomley, of Bradford, Yorkshire—Improvements in the manufacture of figured or ornamented, piled, or plushed fabrics.
702. Nicholas G. Norcross, of Lowell, Massachusetts, United States of America—Improvements in machinery for planing or reducing boards or timber.
735. David Stephens Brown, of 2, Alexandrian Lodge, Old Kent-road—Improvements in engines to be worked by steam, or any other elastic fluid, which invention also includes the apparatus for generating such steam or other elastic fluid.
741. George Edward Dering, of Lockley, Hertford—Improvements in the manufacture of certain salts and oxides of metals.
771. Joseph Rylands, of Kingston-upon-Hull—Improvements in yards and spars of ships and other vessels.
775. George Fergusson Wilson and James Freeman Lee, of Belmont, Vauxhall—Improvements in the manufacture of night-lights and their cases.
776. George Fergusson Wilson, of Belmont, Vauxhall—Improvements in treating certain oily matters, and in the manufacture of oil.
779. William Crofts, of Derby-terrace, Nottingham Park—Improvements in weaving.
783. George Fergusson Wilson, of Belmont, Vauxhall—Improvements in the manufacture of cloth, and the preparation of wool.
784. George Fergusson Wilson, of Belmont, Vauxhall—Improvements in treating certain greasy matters, and in the manufacture of candles.
785. George Fergusson Wilson, of Belmont, Vauxhall—Improvements in the manufacture of night-lights, and in apparatus to be used therewith.
799. Jesse Ross, of Victoria-terrace, Keighley, and Thomas Robert Hafford Ross, of 73, New-walk, Leicester—Improvements in machinery or apparatus for combing wool, cotton, silk, flax, and other suitable fibrous materials.
804. Charles May, of 3, Great George-street, Westminster—Improvements in machinery for manufacturing and rolling iron.
836. William Henry Wells, Edward Mann, and John Harman, of Wandsworth—Improvements in grinding wheat and other grain.

840. Frederick Le Mesurier—Improvements in apparatus for measuring and indicating a given period of time.
842. Christopher Nickels, of York-street, Lambeth—Improvement in machinery for masticating, kneading, or grinding India-rubber, gutta percha, and other matters.

*Sealed 28th May, 1853.*

Year, 1852:

905. Matthew Samuel Kendrick, of Birmingham—Improvements in grates and fireplaces.
906. Matthew Samuel Kendrick, of Birmingham—Improvements in lamps and burners, and in the apparatus to be used therewith.
912. William Jeffs, of Hulme, near Manchester—Improvements in manufacturing letters, figures, and ornamental work, and in the mode of attaching the same to wood, stone, iron, and certain other materials.
914. James Mayelston Haldon, of Lime-street, City—Improvements in the means of rendering wood imperishable and unflammable. (A communication.)
922. Andrew Edmund Brae, of Leeds—Invention of an apparatus for stopping and detaining, or releasing and setting free, cords, tapes, chains, ropes, or other flexible lines or strings.

*Sealed 31st May, 1853.*

923. Charles Hart, of the Vale of White Horse Iron-works, Wantage—Invention of a thrashing, straw-shaking, riddling, and winnowing-machine combined.
925. George Augustus Huddart, of Brynkr, Caernarvonshire—Improvements in the construction of boilers and furnaces for generating steam.
926. Charles Walker, of Heap Bridge, near Bury, Lancashire—Improvements in the method of purifying water for steam-boilers and other purposes.
930. John Dable and William Wells, of Birmingham—Improvements in rolling metals.
937. Ebenezer Poulson, of Monkwearmouth, Durham—Invention of an improved mechanical purchase, applicable to working ships' and other pumps, and to similar purposes.
957. John Rowbotham, of Manchester—Improvements in time-keepers and apparatus connected therewith, for ascertaining the attendance on duty of watchmen and other persons having charge of property. (A communication.)
967. Richard Archibald Brooman, of 166, Fleet-street—Improvements in sawing and saw-mills. (A communication.)
989. Richard Archibald Brooman, of 166, Fleet-street—Improvements in safety-valves. (A communication.)
997. William Baddeley, of 13, Angel-terrace, St. Peter's, Islington—Improvements in apparatus for the conversion of rectilinear into circular motion. (A communication.)
1021. Julien Boileve, of 4, South-street, Finsbury—Invention of an improved desiccating apparatus. (A communication.)
1089. Frederick Joseph Bramwell, of Millwall—Improvements in steam-engines.
1169. John Frederick Gordon, of Strangford, County Down, Ireland—Invention for facilitating the turning of four-wheeled carriages, and bringing the front and hind wheels nearer to each other, entitled, "The Caster Axle."

Year, 1853:

449. William Wilkinson, of Nottingham—Improvements in the manufacture of ropes, bands, straps, and cords.
796. William Edward Newton, of 66, Chancery-lane—Improvements in producing plates or surfaces which may be used as printing or embossing surfaces, or as door-plates, dials, or number-plates, or other plates or surfaces, bearing inscriptions or devices of various kinds. (A communication.)
798. Robert William Sievier, of Upper Holloway, and James Crosby, of Manchester—Improvements applicable to looms for the manufacture of textile fabrics.

#### WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

Date of Registration.	No. in the Register.	Title.	Proprietor's Name.	Address.
May 25	3465	A Camera.	T. Ottewill	24, Charlton-terrace, Barnsbury-road.
" 26	3466	Improved Apparatus to assist the Fly to take off the Fibre from the rollers of Spinning-machines.	George Turner and Thomas Mitchell	Bradford, Yorkshire.
" 31	3467	Gas-burner.	R. W. Winfield	Birmingham.
" "	3468	Throttle-valve.	Mills and Whittaker	Oldham.
" "	3469	Improved Knapsack.	John Drumgoole Brady	Cambridge-terrace, Hyde-pk.
June 1	3470	"The Arca Proteos," forming a Box or Packing-case, and, with the supporting posts, a House for Emigrants, &c.	John George Reynolds	22, Anderson's-buildings, Remington-street, City-road.